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Effects of WTC Exposure in Adolescent Lung and Heart Health

Research: Children are uniquely vulnerable to the effects of environmental contaminants, including those released through disasters. We examined effects of World Trade Center exposure on lung and heart health by comparing adolescents in the World Trade Center Health Registry (WTCHR) who were exposed in the first eight years of life to a matched comparison group.

We successfully recruited 225 comparison adolescents and 183 WTCHR participants. The two populations were slightly more female but similar in race/ethnicity and age distribution. Given that both populations were NYC residents and that exposure to traumatic events was widespread in NYC in the aftermath of the

disaster, the comparison group was not a purely unexposed group, and so we compared groups by their participation in the WTCHR and by exposure to dust and trauma.

We confirmed findings from previous groups documenting increases in asthma after September 11, 2001 in the WTCHR group and in relationship to exposure, but did not find differences in lung function. We also were unable to detect significant differences in arterial stiffness, lipid levels or insulin resistance.

However, biomarkers of chemical exposures such as perfluorinated compounds (PFCs) and dioxins may also be more indicative of exposure and effect, and was the focus of a subsequent cooperative agreement

funded by NIOSH. Indeed, we identified substantially higher levels of PFCs in WTCHR and dust-exposed children, as well as increases in cholesterol levels in direct relationship to PFC levels. PFCs were not related to other cardiovascular endpoints, and analyses of dioxins and cardiovascular endpoints are forthcoming.

These data also raise the question whether effects of earlier – prenatal – exposure may be equally or more problematic. In a newer project we are leveraging two unique and contemporaneous cohorts to examine chemical and psychosocial stressors in relationship to proximity to the WTC site and self-reported exposures, and evaluating birth, neurodevelopment and cardiometabolic outcomes.

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